CLAIMS

1. A method of decontaminating a gas intended for use in photolithography and metrology to remove from the gas or reduce the concentration in the gas of a contaminant which interferes with light transmittance, which comprises removing said contaminant from the gas by passing the gas through a body of decontaminant comprising 10 to 80 percent by volume of an electropositive metal component; 10 to 80 percent by volume of a high silica zeolite; and 10 to 80 percent by volume of a late transition metal compound, wherein each component comprises at least 10 percent by volume of said composition and the total of the components equals 100 percent by volume.

2. A method as in Claim 1 wherein the body of the decontaminant comprises a mixture of an electropositive metal component, a high silica zeolite, and a late transition metal compound in a ratio on or within the area bounded by the line A-B-C in Figure 2.

3. A method as in Claim 1 further comprising removal of the contaminant prior to or after treatment of the gas to remove solid particulate matter from the gas.

4. A method as in Claim 1 wherein the contaminant is gaseous.

5. A method as in Claim 4 wherein the contaminant comprises a neutral polar gaseous molecule.

6. A method as in Claim 4 wherein the contaminant comprises a neutral polar aprotic molecule.

7. A method as in Claim 4 wherein the contaminant comprises a protic or aprotic alkaline molecule.

8. A method as in Claim 4 wherein the contaminant comprises an acidic polar species.

9. A method as in Claim 4 wherein the contaminant comprises an environmental gas.

10. A method as in Claim 1 wherein the contaminant comprises at least one of gaseous or entrained water, an alcohol, a nitrogen oxide, a sulfur oxide, an organic sulfide, an organic halide, an amine, a hydrocarbon, a siloxane, a carbon oxide or an environmental gas.

11. A method as in Claim 1 wherein the gas after decontamination is used in photolithography.

12. A method as in Claim 1 wherein the gas after decontamination is used in metrology.

13. A method as in Claim 1 wherein the concentration of the contaminant in the gas is reduced to not more than 1 ppb.

14. A method as in Claim 13 wherein the concentration of the contaminant in the stream is reduced to not more than 100 ppt.

15. A method as in Claim 14 wherein the concentration of the contaminant in the gas is reduced to not more than 1 ppt.

16. A method as in Claim 1 wherein the contaminant removed or reduced comprises a contaminant which interferes with transmittance of light having a wavelength of 248 nm.

17. A method as in Claim 16 wherein the concentration of the contaminant in the gas is reduced to not more than 1 ppb.

18. A method as in Claim 1 wherein the contaminant removed or reduced comprises a contaminant which interferes with transmittance of light having a wavelength of 193 nm.

19. A method as in Claim 18 wherein the concentration of the contaminant in the gas is reduced to not more than 100 ppt.

20. A method as in Claim 1 wherein the contaminant removed or reduced comprises a contaminant which interferes with transmittance of light having a wavelength of 157 nm.

21. A method as in Claim 20 wherein the concentration of the contaminant in the gas is reduced to not more than 100 ppt.

22. A method as in Claim 1 wherein the contaminant removed or reduced comprises a contaminant which interferes with transmittance of light having a wavelength $\leq$100 nm.

23. A method as in Claim 22 wherein the concentration of the contaminant in the gas is reduced to not more than 1 ppt.

24. A method as in Claim 1 further comprising a providing a generator of coherent light as a source of light for the photolithography or metrology.

25. A method as in Claim 24 wherein the generator or coherent light comprises a laser.

26. A method as in Claim 1 further comprising a providing a generator of noncoherent light as a source of light for the photolithography or metrology.

27. A composition for decontaminating a gas intended for use in photolithography and metrology by removing from the gas or reducing the concentration in the gas of a contaminant which interferes with light transmittance, which composition comprises:

10 to 80 percent by volume of an electropositive metal component;

10 to 80 percent by volume of a high silica zeolite; and

10 to 80 percent by volume of a late transition metal compound,

wherein the total composition comprises 100 percent by volume.

28. A composition as in Claim 27 which effects a reduction in the contaminant content of said gas stream to not more than 1 ppb.

29. A composition as in Claim 28 which effects a reduction in the contaminant content of said gas stream to not more than 100 ppt.

30. A composition as in Claim 29 which effects a reduction in the contaminant content of said gas stream to not more than 1 ppt.

31. A composition as in Claim 27 wherein at least one of the electropositive metal component, the high silica zeolite and the late transition metal compound is in a particulate, coating, pelletted, extruded, plate or powder form, or a mixture of such forms.

32. A composition as in Claim 27 wherein the electropositive metal in the 2 electropositive metal component comprises a Group 3 or 4 metal, metal salt or metal oxide.

33. A composition as in Claim 32 wherein said electropositive metal 2 component comprises a Group 3 or 4 metal oxide selected from the group consisting of titania, zirconia, yttria, or vanadia.

34. A composition as in Claim 33, wherein the metal oxide comprises titania.

35. A composition as in Claim 32, wherein the electropositive metal 2 component has a surface area in the range of 140-1200 m^2/g.

36. A composition as in Claim 35 wherein the electropositive metal 2 component has a surface area in the range of 140-500 m^2/g.

37. A composition as in Claim 27, wherein said high silica zeolite comprises 2 a zeolitic structure with an silica:alumina ratio of at least 90:1.

38. A composition as in Claim 37 wherein said high silica zeolite comprises 2 a zeolitic structure and a silica:alumina ratio of at least 300:1.

39. A composition as in Claim 38 wherein said high silica zeolite comprises 2 a zeolitic structure and a silica:alumina ratio of at least 400:1.

40. A composition as in Claim 39 wherein said high silica zeolite comprises 2 a zeolitic structure and a silica:alumina ratio in the range of 400-2000:1.

41. A composition as in Claim 27 wherein said high silica zeolite comprises 2 Zeolite Y or zeolite ZSM-5.